



UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
097412.510	10/05/99	ITOH K	0756-2045

IM61/0511
SIXBEY FRIEDMAN LEEDOM & FERGUSON PC
8180 GREENSBORO DRIVE
SUITE 800
MCLEAN VA 22102

EXAMINER
PADGETT, M

ART UNIT	PAPER NUMBER
1762	13

DATE MAILED: 05/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

BEST AVAILABLE COPY

Office Action Summary

Application No.

09/412,570

Applicant(s)

Itoh et al

Examiner

M.L. Padgett

Group Art Unit

1762

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 5/22/00, 10/3/00 & 2/6/01
- ☒ This action is FINAL
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1 + 18-30 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1 + 18-30 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 8,10 ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other _____

Office Action Summary

Art Unit: 1762

1. The examiner noted that the transmittal papers for this continuation have the serial number for the parent wrong (08/604,714 instead of 08/604,713). The error caused by this in PALM has been corrected. However, the insert in the first sentence of the specification needs to list its serial number followed by -- now U.S. Patent ...--. Also, a supplemental declaration providing the foreign application numbers for the two unassigned ones is needed.

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

2. Claims 1 and 18-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Use of relative terms that lack clear metes and bounds in the claims, or definitions of such in the specification or relevant cited prior art, are vague and indefinite. See "reactive" in claims 20, 23, 25 and 28. The gas is reactive to what, under what conditions, etc? Note that similarly "raw" in "raw...gas" is not seen to add any meaningful limitation to the claim, but is not relative. In claims 19, 20, 23, 25 and 28 "the vicinity..." besides lacking proper antecedent basis, provides

Art Unit: 1762

no clear bounds on the dimensions of the plasma not already covered by “localize”. As written, the claim appear consistent with *in situ* plasmas. While in some usages “adjacent” might be said to be relative, in claim 1 it appears to be used in the contents of next to, hence is OK. Applicant’s discussion (page 6 of the 2/6/01 response) concerning the inlets, is not consistent with the context of the claim as written, which appear to be giving a direction for the gas to be input from the inlets orientation/arrangement, thus the phrasing could be considered ambiguous.

In claims 1, 20, 23, 25 and 28, in lines 3, 6, 6, 6 and 5, respectively “a plasma” uses the wrong article for a limitation previously introduced on lines 1. Likewise, for “a substrate” in claims 20, 23, 25 and 28 on lines 9, 9, 9 and 7, respectively.

Use of “like” in patent limitation is generally improper. In claim 28 see “slit-like inlet”. How is it like a slit, but not as slit? Note that diamond-like carbon of claim 21 has an art recognized meaning, so is OK.

In claims 26 and 29, was “said gas is 10 mm or less” really intended?² Such units have no meaning appropriate to gas that is known to the examiners, especially within the context of the claims.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CAR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

Art Unit: 1762

provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CAR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CAR 3.73(b).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

~~The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:~~

4. Claims 1, and 18-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of U.S. Patent No.

6,001,431. Although the conflicting claims are not identical, they are not patentably distinct from each other because: alternative equivalent wording, and different orders of claiming, do not produce claims with significantly different meanings, nor does the claim of a gap dimension by its self, or the use of plural generic inlets; or specific gas pressure. Note that while the patent claims contain more limitations or description than the present claims, except for those listed above, all features of the instant claims are contained in the patent claims. Also note, that as there is no clearly recognizable difference between "raw material gas" and a "reactive gas," they cannot be considered to be distinguishing features.

Art Unit: 1762

For the claim of a single dimension of the apparatus, and none others, ^{lacks significance} as there is no context to make such a dimension meaningful. Specifically, specifying use of a specific gap size when the size of electrodes, chambers and substrates to be treated is unknown, when the materials (substrate and gas) is unspecified, when the affect of the plasma treatment is not defined, has no identifiable significance. One of ordinary skill would use electrodes with the gap between adjusted according to all of the above considerations.

While the patent claims do not claim (1) specific pressures in the chambers; or (2) a plurality of generic gas ports used in the process, these claimed limitations would have been obvious to one of ordinary skill in the art, because (1) the pressures used in the plasma process would have been optimized for desired affects, particular gases and chamber configurations; and (2) patent claim 5 generates a plurality of sheet beam plasmas from "slit-like inlets" (plural), hence the claim of a plurality of generic gas inlets does not give any specific effect not already claimed in the parent patent. Note, the formation of multiple successive planes of plasma as in patent claim 5, or the use of multiple sets of closely spaced gas inputs that each produce the same gas flow effect as a single continuous slit (which relates to previous more specific claim language) are functionally equivalent.

5. Art cited for showing the use of roll to roll feed as previously claimed includes Takahashi et al, Muria et al an Fujioka et al, and remains relevant to the claim of moving substrates and magnetic tapes.

Art Unit: 1762

6. Claims 1 and 18-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al, in view of Yanagihara et al, and further in view of Venkataramanan et al (for claims 25-30).

Takahashi discloses a method of producing a magnetic recording medium by forming a ferromagnetic metallic film on a non-magnetic medium followed by the formation of a protective layer (col. 2, line 66 - col. 3, line 6) using a roll to roll continuous coating apparatus. Fig. 1 described on col. 4, line 30-col. 5, line 50, teaches use of plasma generating nozzles 26 and 31, containing electrodes 27 and 32 connected to power sources 29 or 34, which maybe D.C. , A.C. or R.F., and contain openings for gas from inlets 28 and 33 to pass through the electrodes towards the moving substrate in a direction perpendicular to the tangent of the surface. The roller on which the substrate resides (i.e., is adjacent to) is D.C. biased, hence acts as an electrodes in the system. The protective layer can be diamond-like carbon (DLC) described on col. 4, lines 60-68 and col. 6, lines 34-36; and CH type reactive gases at partial pressures of 0.5-.001 torr are employed. Note the plasma would inherent^{ly} be "localized in the vicinity" of the nozzle electrode. However, Takahashi fails to teach a configuration that would necessarily have all the gas input perpendicular, have slit like openings, grounded first electrode, or the size of the gap between roller and nozzle electrodes. It is well known in the art to manipulate the geometrical configuration of a plasma apparatus for coating/ plasma treating surfaces on drums or planner running lengths, and the U.S. patent Yanagihara et al (4,910,041) demonstrates such with figures 9-11, discussed in col. 6, lines 9-30, which show sheet like electrodes shaped to match the

Art Unit: 1762

substrate shape. It would have been obvious to employ such configurations in the teachings of Takahashi et al, for the taught advantages of the shaping being designed so that films are evenly formed on the substrate surfaces. Furthermore, analogous plasma process are being discussed as Yanagihara et al uses carbon-containing source gases, and may deposit diamond-like carbon (abstract; col. 1, lines 5-15; col. 3, line 15-col. 4, line 26; & claim 17). Also, the holes in Yanagihara et al's sheet electrodes may be a plurality of parallel slits (Fig. 2, col. 5, line 13-49 and col. 6, lines 27-30), hence demonstrate useful 3-D configuration applicable to the 2-D opening of Takahashi et al. Note that the microwave energy applied to the discharge electrodes of the secondary reference, are a range of high frequency or R.F., hence principles discussed therein would have been relevant to the primary reference. Further note that average pressures shown in the tables in Yanagihara et al are all within the bounds of those claimed by applicant, providing further evidence of the known usefulness of such pressure values for at least DLC deposits.

As mentioned above, the claim of a specific range of 'gap' values between the electrodes in claims 25-30, lacks patentable significance due to its lack of context. While no such values are discussed in the Takahashi et al. references, one of ordinary skill in the art would determine the needed degree of gap according to the effect desired (unspecified by claims), the materials involved (unspecified by claims); the overall dimension of electrodes and materials being treated (also unspecified by claims); etc. When references do not specify values for parameters that they are clearly using, one of ordinary skill in the art would consider such values to be determinable by routine experimentation. Alternately, Venkataramanan et al (abstract; Fig. 3; col. 3, lines 10-32;

Art Unit: 1762

col. 5, lines 1-40 and esp. col. 6, lines 6-12) who deposits DLC films via a plasma process, where parallel R.F. electrodes (50- porous for gas input) and (98 - lower electrode and substrate support) are used, exemplifies spacings of 0.5 cm, i.e. 5 mm. It would have been obvious to one of ordinary skill in the DLC plasma deposition art, that the electrode spacings of Venkataramanan et al, would have provided an expected effective starting point for optimizing spacings in Takahashi et al DLC deposition process, as analogous electrode configurations/orientations may be employed for obtaining like deposits. That both Venkataramanan and Takahashi et al feed gas through their upper electrodes is significant to the similarity of the process, and similar expected effective electrode separations. While Yanagihara et al's Fig. 18 and 12A (col. 8, lines 55-68 and col. 15, lines 26-35) are noted to discuss 1-10 mm and 5 mm spacings between anode and cathodes, these electrodes examples do not place the substrate between them, however they do further show how typical the claimed gap values are.

Note that when a continuous substrate passes between two electrodes, it is adjacent to both of them, and that the "direction" in which an inlet is arranged is normally perpendicular to the surface through which the inlet is made. That all of a plurality of inlets would have the same relative orientation, would have been expected unless otherwise shown or stated. There is nothing else about "a plurality of inlets", i.e. two or more inlets, that has any inherent direction in the context of the claims as presently written. It is further noted, that when placing RF signals between two parallel plate electrodes, it is typical for one of the electrodes to be connected to

Art Unit: 1762

ground, hence it would have been obvious to use such circuit configurations for their conventional purposes.

7. Claims 1 and 18-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 4-5, 7-9 and 11-15 of U.S. Patent No. 6,001,432. Although the conflicting claims are not identical, they are not patentably distinct from each other because the presently claimed subject matter is presently claimed subject matter is present, but claimed in different orders, or overlapping ranges, as with different phrasings that cover equivalent meanings, such "openings that is elongated in a first direction". Also, obvious arguments for conventional features as discussed above also apply.

8. Claims 1 and 18-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-4, 7, 10, 13 and 17, or claims 1-2, 7-8, 10-12, 16, 17, 20-24 and 27-68, respectively of U.S. Patent No. 5,766,696 or No. 6,183,816 B1 in view of Yanagihara et al, as applied above in section 6.

Further note in Yanagihara et al that the shaping of the electrode to match the substrate configuration is analogous to what is done by Itoh (696) as seen in Fig. 2 (Itoh), and Fig. 9-11 (Yanagihara), and that the secondary reference further teaches making a composite electrode structure of multiple electrodes or alternately or single electrode with slots, providing further motivation. As pretreatment of substrate materials is frequently used for improving adhesion of subsequent coatings, such procedures would have been expected to be useful in the present invention for their conventional purposes.

Art Unit: 1762

9. Applicant's arguments with respect to claims 1 and 18-30 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CAR 1.136(a).

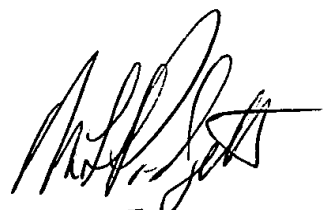
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CAR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication should be directed to M.L. Padgett at telephone number (703) 308-2336 on Monday-Friday from about 8:00 a.m. to 4:30 p.m., and FAX # (703) 305-3599 (official) or 305-6078 (unofficial).

M.L. Padgett/dh

May 8, 2001

May 11, 2001


MARIANNE PADGETT
PRIMARY EXAMINER
GROUP 1700